2005 Program Highlights

Fisheries

Fisheries stock assessments completed: A new metapopulation stock assessment model for Northwestern Hawaiian Island (NWHI) lobsters was completed and is undergoing external review. The current status of Hawaiian archipelago bottomfish was reviewed and a new standardized time-series of catch per unit effort for Hawaiian archipelago bottomfish was generated for a benchmark stock assessment to be conducted in 2006. Contributions were made to stock assessments of yellowfin and bigeye tuna directed by the Secretariat of the Pacific Community in support of the Western and Central Pacific Fisheries Commission. Working Group meetings of the International Scientific Committee on Tuna and Tuna-Like Species in the North Pacific Ocean (ISC) were convened to prepare for new stock assessments of blue shark, striped marlin, and swordfish in the North Pacific.

Recreational fishery practices improved: An outreach and education program was launched to encourage shoreline and near-shore fishers in Hawaii to use barbless circle hooks, instead of their customary hooks, as a way to increase the survival of fish tagged and released after capture and reduce any injury to protected green sea turtles or Hawaiian monk seals that might be hooked accidentally. With the help of anglers, data are being collected to evaluate the success of the program.

Shoreline fisheries monitoring enhanced: In cooperation with local fisheries agencies, shoreline-based creel surveys were implemented in American Samoa and the Northern Mariana Islands to improve the monitoring of coral reef fisheries resources.

Sea turtle and seabird bycatch reduced in the Hawaii longline fishery: Bycatch reduction measures developed by scientists at PIFSC and NOAA's Southeast Fisheries Science Center have led to a dramatic reduction in incidental takes of seabirds and sea turtles in the Hawaii-based longline fishery. Takes of seabirds and turtles in 2005 were just a few dozen animals, compared with hundreds (turtles) or thousands (seabirds) per year in the late 1990's. Bycatch reduction has been a successful partnership between NMFS, the Western Pacific Regional Fishery Management Council, conservation groups, and the fishing industry.

International sea turtle bycatch research expanded: Besides the successful work in Hawaii, PIFSC scientists are collaborating in on-going experiments to reduce sea turtle bycatch in longline fisheries of Japan, Korea, the Philippines, Costa Rica, Guatemala, Ecuador, Brazil, Spain, and Italy, and are developing logistics for similar experiments in Indonesia, Papua New Guinea, and Vietnam.

[1] A non-comprehensive listing of the variety of activities carried out in 2005.

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Major biological reference published: "Checklist of the Fishes of the Hawaiian Archipelago," authored by PIFSC scientist Bruce C. Mundy, was published by the Bishop Museum Press. The 704-page book provides detailed information on the known diversity, biogeographic origins, behaviorally defined habitats, and conservation status of the 1,250 fish species known from the area.

Fish life history studies expanded: Research on the life history characteristics of fishes caught in Hawaii-based longline and bottomfish fisheries has been expanded to improve the biological basis for stock assessments. Age and growth studies based on growth rings on hard parts are underway on bottomfish, swordfish, snake mackerel, and lancet fish – the latter two species prominent in the longline fishery bycatch.

Lobster growth and mortality studied: A multi-year cooperative lobster research program continued in the Northwestern Hawaiian Islands. PIFSC scientists on contracted lobster fishing vessels tagged and released spiny and slipper lobster at Necker Island and Maro Reef to study their growth, movements, and survival.

Protected Species

Understanding of monk seal survival improved An apparent link between the survival of juvenile Hawaiian monk seals in the northern part of the NWHI and the southern extent of the Transition Zone chlorophyll front has been detected. Survival is higher when the front is closer to the NWHI. Research has also identified a top-down structuring of the ecosystem by monk seals – their predation pressure has reduced prey biomass. Both studies improve understanding of the monk seal forage base and its relationship to survival.

Monk seal habitat surveyed: Surveys were conducted to create the first-ever elevation maps of selected low-lying terrestrial habitat in the NWHI. The maps were used to estimate potential effects on monk seal survival of sea level rise projected to occur by the year 2100.

Protected species study guides created: Key information about Hawaiian monk seals and Hawaiian green sea turtles has been compiled and organized into reference guides that have been incorporated into the Library section of the PIFSC Web site. These resources are directed towards students and other public visitors to the Web site. Each online guide includes fact sheets, lists of important references, and Web links to relevant scientific journals, research and conservation organizations, and online databases.

Cetaceans studied in fishing grounds: Bottom mounted high-frequency acoustic recording packages (HARP) have been deployed at Cross Seamount, south of the main Hawaiian Islands (MHI), and in waters off Palmyra Atoll. The instruments were placed in strategic locations to record acoustic information in areas where false killer whales

interact with gear set by fishing vessels. Seamounts are known to enhance local, near-surface primary and secondary productivity and may be important feeding locations for cetaceans in surfaces waters found throughout large portions of the Pacific Islands Region (PIR).

Cetacean research workshop held: In June 2005, the PIFSC convened a workshop of cetacean experts to review and assess knowledge about cetaceans in the western and central Pacific, identify important gaps in knowledge, and provide direction for future research.

Monk seal foraging workshop convened: In March 2005, PIFSC a two day workshop was held to assess current progress in monk seal foraging research, discuss topics requiring additional research, and provide recommendations on research priorities. Participants included PIFSC staff, collaborating international scientists specializing in foraging and population ecology, and a representative of the Marine Mammal Commission.

Sea turtle research partnerships expanded: Plans to study the pelagic ecology and oceanic migrations of loggerhead turtles in the North Pacific using satellite tracking methods were expanded and strengthened. The research involves close collaboration with sea turtle experts from Japan, Taiwan and Korea. The focus of the research is to help reduce longline and other fishery interactions with this endangered and declining sea turtle.

Important habitat for loggerhead turtles discovered: An important foraging habitat for loggerhead sea turtles was identified in the Kuroshio Extension Bifurcation Region (KEBR) of the western North Pacific by combining satellite telemetry data from 43 juvenile loggerheads with oceanographic data collected by satellite-borne remote sensors. Within the KEBR, juvenile loggerheads resided in Kuroshio Extension Current (KEC) meanders and associated anti cyclonic (warm core) and cyclonic (cold core) eddies during the fall, winter, and spring. During this period surface waters of the KEC contain high levels of chlorophyll. This research was conducted by the Ecosystems and Oceanography Division and the Port of Nagoya Public Aquarium in Japan.

Habitat

Marine debris removed: As part of a multi-agency effort, PIFSC and the U.S. Coast Guard removed 57 tons of derelict fishing gear from the NWHI. This completed a five-year, large-scale survey and removal program in the NWHI. Next year, debris removal will continue at targeted high-priority areas in the NWHI and an initial survey and removal program will begin in the MHI.

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Habitat mapped in Saipan anchorage: In support of the U.S. Navy, PIFSC scientists used multibeam and video validation data to characterize benthic habitat for the Saipan anchorage in the Commonwealth of the Northern Mariana Islands.

Larval transport studied: PIFSC used ocean models to describe reef fish larval transport. Along with specimen collections and laboratory analyses, the research will enable development of a metapopulation dynamics model of movement within the Hawaiian Archipelago. Additional studies were continued with trace elements in fish otoliths, used to characterize the pelagic environments experienced by individual larvae during their planktonic dispersal stage. Completion of this work will ultimately provide a series of case studies elucidating the connectivity and dispersal among MHI and NWHI meta-populations of select but representative species of shallow-water reef fishes.

American Samoa longline habitat: PIFSC research cruises on the NOAA Ship *Oscar Elton Sette* and supporting research on American Samoa commercial longline boats has yielded data describing how variations in the American Samoa longline fishery for albacore are affected by changes in the South Equatorial Counter Current. This research will help predict the strong ebbs and flows that have characterized this fishery since its inception in the 1990s.

Seafloor habitat mapped: Multibeam sonars were used to map 3000 km^2 of seafloor during survey operations on the NOAA Ship *Hi'ialakai* and the 25-ft survey launch *AHI*. Surveys were conducted at French Frigate Shoals, Maro Reef, Pearl and Hermes Atoll, and Kure Island in the NWHI, and at Ni'ihau and Penguin Bank in the MHI. Data enabling accurate delineation of 25-, 50-, and 100-fm isobaths were also collected, filling an important management need for the NWHI Coral Reef Ecosystem Reserve.

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Ecological reef assessments conducted: The first PIFSC Reef Assessment and Monitoring Project (RAMP) cruise was conducted in the MHI aboard the *Oscar Elton Sette* and the *Hi'ialakai*. RAMPs are multi-disciplinary, providing information on fish, corals, other invertebrates, and algae in the context of their benthic and oceanographic habitats of the coral reef ecosystems. The second RAMP cruise to the Commonwealth of the Northern Mariana Islands and Guam, and the first ever survey at Wake Atoll, was also conducted in 2005, in partnership with University of Guam Marine Laboratory, the CNMI Division of Fish and Wildlife, the U.S. Army, the CNMI Division of Environmental Quality, the CNMI Coastal Resources Management Office; and the Guam Division of Aquatic and Wildlife Resources.

Coral reefs surveyed in Line Islands: PIFSC also participated in a multi-agency expedition to assess coral reef ecosystems in the northern Line Islands, including Palmyra and Kingman Atolls (U.S.) and Christmas and Fanning Atolls and Washington Island (Kiribati). The multidisciplinary surveys, led by the Scripps Institution of Oceanography, assessed the effects of human exploitation on fishery resources other ecosystem components.

Other Studies

Fisheries metadata compiled: PIFSC staff have developed detailed metadata describing the Center's collections and holdings of fisheries statistics and fisheries research survey data. These metadata have been packaged into a Data Catalog for posting on the Center's Intranet, making the information readily available to all Center staff. A more comprehensive project is now being launched to compile and disseminate metadata for data collections in all Center research programs. Metadata for fisheries-dependent data will be incorporated in the new NMFS enterprise metadata registry called InPort, developed by the PIFSC.

Social and economic studies completed: A project to collect and analyze data on socio-cultural structure in the Hawaii longline fishery was completed. In addition, a system to collect economic data from the Hawaii-based longline fishery was implemented in cooperation with the Pacific Islands Regional Office (PIRO) longline observer program and longline fishery participants.

PIFSC heads U.S. delegation to PISCES: PIFSC led the U.S. delegation to the annual meeting of the North Pacific Marine Science Organization (PISCES) in Vladivostok, Russia. NOAA scientists from four NMFS Science Centers and several other NOAA research groups participated in PICES working groups. PICES helps to enhance and coordinate ecosystem research in the North Pacific with an increasing emphasis on living marine resource conservation and management.

PIFSC scientists on U.S. delegation to WCPFC Scientific Committee: PIFSC scientists represented the United States on the Scientific Committee of the new Western and Central Pacific Fisheries Commission (WCPFC). PIFSC scientists were also active in working groups of the WCPFC, helping to conduct stock assessments and related research.

Institutional

Workplace safety stressed in office and at sea: A safety committee comprised of representatives from each Center division was established to tackle several safety issues, provide training on workplace safety topics, and develop safety policies. An extensive safety section was implemented on the Center's intranet, providing employees with ready access to safety plans and other resources. Operational Risk Management training was provided to Hawaiian monk seal program employees, personnel on the NOAA Ship *Hi'ialakai,* and PIFSC small boat operators.

Workplace injuries reduced: In 2005, the PIFSC reduced its rate of OSHA-recordable injuries in the federal workforce from 9 to 2 compared with 2004. Injuries in the JIMAR

workforce were reduced from 10 to 5. We attribute the reduction in injuries to our continued emphasis on behavior change, compliance with safety guidelines, and training.

EEO and Diversity programs enhanced : PIFSC and PIRO formed the first Pacific Islands EEO and Diversity Advisory Committee (EEODAC) The purpose of the committee is to enhance Equal Employment Opportunity, Affirmative Employment, and diversity initiatives for NOAA Fisheries Service offices in the central and western Pacific. The committee advises management and coordinates outreach events related to EEO and diversity.

The committee coordinated and sponsored two diversity related training sessions. In addition, the committee hosted special emphasis awareness events for Hispanic Heritage Month, Asian/Pacific Islander Heritage Month, and Women's Equality Day.

The PIFSC participated in two diversity related internship programs including Entry Point, a disability focused internship program, and Kumu Ola, an internship program geared towards providing real world opportunities to Native Hawaiians and other underserved minorities in Hawaii. Three interns were placed through these programs in 2005.

Finally, PIFSC remained compliant with agency EEO and Sexual Harassment training requirements. PIFSC offered three training sessions on the awareness and prevention of sexual harassment.

Plans take shape for new NOAA facility: NOAA is moving ahead with plans to design and build a comprehensive new facility on Ford Island, Pearl Harbor, to house most Honolulu offices of NOAA agencies, including the PIFSC. Center staff have participated in several working groups to help plan important details of the facility, including office and laboratory space, small boat facilities, the library, a common telecommunications and information technology center, and various workplace amenities. The new facility is scheduled for completion in 2010, but some functions, such as support for NOAA research vessels, will be enabled sooner.